



# ELECTROMAGNETIC FIELDS AND SLEEP

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Sleep, both qualitatively and quantitatively, plays a particularly important role in maintaining daytime vigilance, good concentration and cognitive performance during the day.

It also guarantees the replenishment of energy reserves in the muscles and nervous system, the proper balance of hormonal secretions, the regulation of blood sugar levels, the elimination of toxins and the maintenance of an efficient immune system.

It is also involved in the regulation of mood, learning and memory functions.

It is therefore easy to understand that it plays an essential role in the balance of our lives, especially when you are a Biohacker looking for your best level of psychophysiological functioning.

## MELATONIN AND SLEEP

The quality of sleep depends largely on the proper timing of melatonin secretion.

Melatonin has been a fashionable molecule since it is dispensed to treat "sleep disorders" and regulate "jet lag". Lerner<sup>1</sup> was studying the effect of melatonin in patients with vitiligo when he found that it produced drowsiness. This was the start of intense research activity on this multifunctional substance since the 1980s.

It is considered to be the mother hormone of chronobiology because ALL hormonal cycles depend on its secretion and its cycle. Thus, reduced secretion modifies all these cycles with potentially dangerous consequences on health.

An optimal synchronization of melatonin secretion corresponds to an ideal synchronization of sleep/wake cycles.

Generally speaking, melatonin secretion decreases rapidly with advancing age, which is why aging is very frequently accompanied by sleep disorders.

Other factors intervene to decrease melatonin secretion or disrupt its synchronization.

This is the case of **exposure to artificial electromagnetic (EM) fields**, especially for certain categories of people with increased individual sensitivity, or the elderly, and/or with a high body mass index.<sup>2,3</sup>

## MELATONIN AND ELECTROMAGNETIC FIELDS

The Pubmed scientific database shows 309 publications with the keywords "melatonin" and "electromagnetic fields".

EM fields, and in particular low frequency fields (ELF), can disrupt the levels and phases of melatonin secretion.

Low frequency fields are emitted by most of the electrical devices we use (cell phones and DECT, household appliances, hair dryers, tablets, VDU and TV screens etc.).

Published research indicates that the main effects of low-frequency and/or low-intensity fields lie in the disruption of sleep structure, or R.E.M. sleep (Rapid Eye Movement).<sup>4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</sup>

Sleep quality depends on a harmonious secretion of melatonin, and it can be altered by the dysregulation of the rhythm of its production.

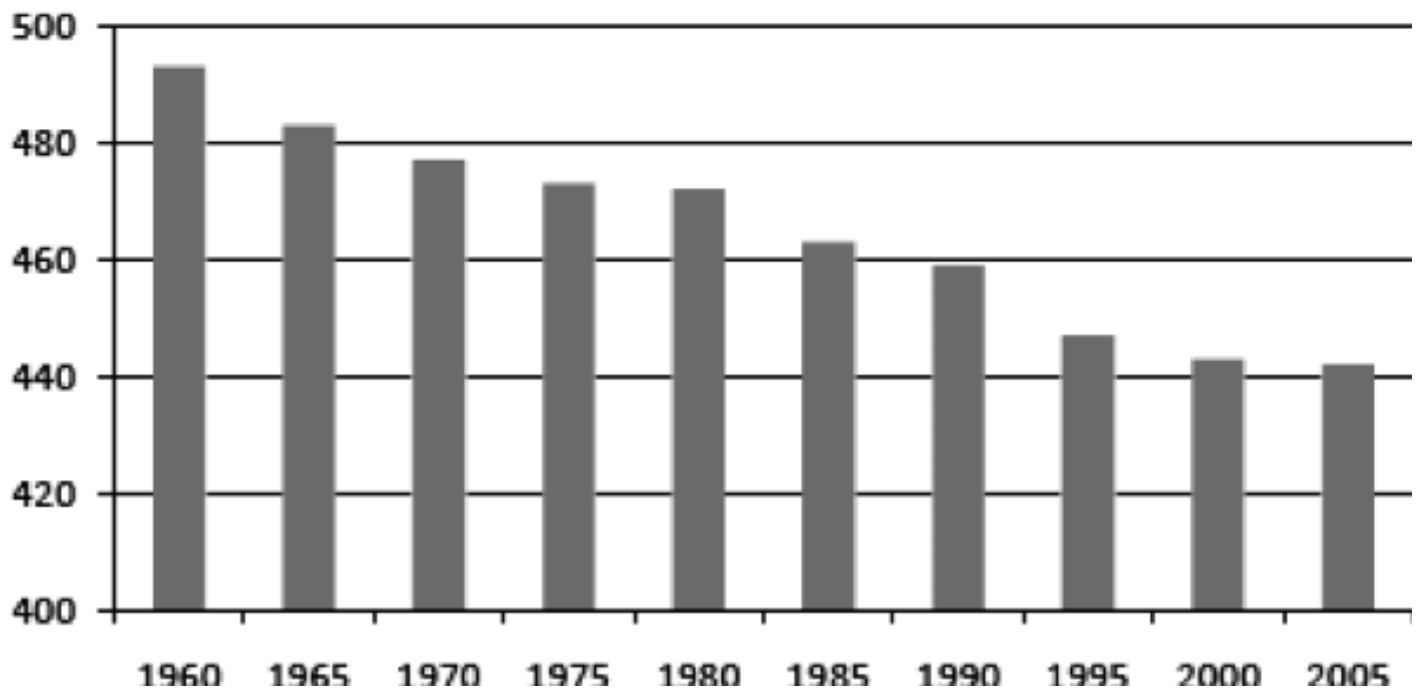
During the second half of the 20th century there has been an exponential increase in artificial electromagnetic fields in our environment. At the same time, sleep duration in technologically advanced countries has steadily decreased.

Let's take the example of Japan<sup>17</sup>:

In people aged 10 years or older, the average sleep duration in Japan decreased over these 40 years (Fig. 2; Broadcasting Culture Research Institute, 2006) from 493 minutes in 1960 to 447 minutes in 1995.<sup>17</sup>

# Average sleep duration

minutes



Changes in the average daily sleep duration of people aged 10 years or older in Japan. ( Broadcasting Culture Research Institute, 2006)

## PROTECTIVE MEASURES

When reading these studies and the consequences of altered melatonin levels on physiological processes and the resulting health problems, one might think that the solution is to supplement melatonin.

This is a flawed approach because restoring a level of melatonin that allows homeostasis to be regained without protection against the action of electromagnetic fields is only a partial solution. In fact, these fields also lead to an overconsumption of melatonin in the periphery, which then compromises its role as an antioxidant in the tissues.<sup>18</sup>

Moreover, providing exogenous melatonin is not sufficient to solve this deficit because of the problems of its absorption (linked to intestinal hyperpermeability), its bioavailability and the difficulty in passing through the blood-brain barrier. It is like trying to fill a leaky barrel!

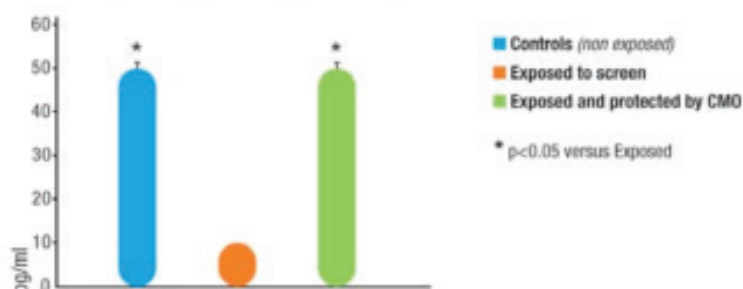
On the other hand, several publications have demonstrated the restoration of normal melatonin levels in animals due to protection against EM fields by C.M.Os.<sup>19, 20, 21</sup>

## MELATONIN PRODUCTION

When mice were exposed to a screen for 11 weeks, there was an 80% drop in plasma melatonin.

The group exposed and protected by the C.M.O. regained a value equivalent to the control group.

*Melatonin levels of mice exposed during 11 weeks to a VDU screen*



*Mice – 11 weeks of exposure - VDU screen (cathode ray tube, television and computer)*

*Bastide M, 1997 - Youbicier-Simo B-J, 2001 – Montpellier University, France*

### Conclusion:

The circadian cycle of melatonin is one of the primary rhythms governing life and biological phenomena in general. Processes regulated by melatonin have been, and are increasingly disturbed by the exponential rise in the electromagnetic fog we are being subjected since the 1990s.

The C.M.O. technology developed by Comosystems enables the body to normalize at least twenty biological parameters, including the production of melatonin. This biological optimization allows people to improve their quality of sleep, guaranteeing a better quality of life and therefore a better performance.

### Références:

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